

C L A I M S

1. A tyre assembling apparatus, comprising:

5 - an assembling drum (2) having first (3a) and second (3b) halves that are axially opposed along a geometric axis (X) of the drum itself, each of said halves (3a, 3b) comprising a plurality of circumferentially distributed radial sectors (5);

10 - radial-movement devices (6) associated with each of said halves (3a, 3b) to selectively translate the corresponding sectors (5) between a contracted condition in which they are disposed closer to the geometric axis (X) of the drum (2) and an expanded condition in which they are disposed spaced apart from the geometric axis (X) of the drum (2);

15 - at least one axial-movement actuator (4) to translate said halves (3a, 3b) relative to each other, between a condition in which they are close to each other and a condition in which they are spaced apart from each other along the geometric axis (X) of the drum (2);

20 characterized in that each of said sectors (5), comprises:

- a holding member (14, 15) defining an engagement seat of an annular anchoring structure to the bead (10) being part of a carcass sleeve (7) fitted on said drum (2); and

25 - a supporting member (23) linked, relative to said holding member (14, 15), in a position axially internal to the latter and movable between a first operating condition in which it is axially spaced apart from the holding member to provide a supporting seat to at least one ply being part of said carcass sleeve (7) and a
30 second operating condition in which it is disposed axially close to the holding member to enable mutual approaching of said halves (3a, 3b).

2. Apparatus as claimed in claim 1, wherein said supporting member (23) is slidably engaged along at least one guide rod (24) extending in cantilevered fashion from said holding member (14, 15).

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3. Apparatus as claimed in claim 2, wherein said guide rod (24) extends in parallel to the geometric axis (X) of the assembling drum (2).

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4. Apparatus as claimed in claim 1, comprising at least one elastic return member (25) operatively associated with the supporting member (23) to elastically urge it away from the holding member (14, 15).

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5. Apparatus as claimed in claim 2, comprising at least one return spring (25) associated with said guide rod (24) to elastically urge the supporting member (23) apart from the holding member (14, 15).

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6. Apparatus as claimed in claim 2, wherein the guide rods (24) of the supporting members (23) associated with the first (3a) and second (3b) halves respectively, are angularly offset relative to each other.

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7. Apparatus as claimed in claim 1, wherein the supporting members (23) associated with the first (3a) and second (3b) halves respectively, have abutment surfaces (23a) facing each other and spaced apart from each other respectively by an amount smaller than the stroke carried out by said halves between their spaced apart condition and approaching condition.

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8. Apparatus as claimed in claim 1, wherein the supporting members (23) of each of said halves (3a, 3b)

are susceptible of being translated towards the respective holding members (14, 15) following a thrust action against the supporting members (23) associated with the other half during mutual axial approaching of said halves.

9. Apparatus as claimed in claim 1, wherein the supporting members (23) associated with each of said halves (3a, 3b), under a radially-expanded condition define a substantially continuous cylindrical supporting surface.

10. Apparatus as claimed in claim 1, wherein each of said supporting members (23) has end slots (27) slidably housing end projections (28) provided on the circumferentially adjoining supporting members (23).

11. Apparatus as claimed in claim 1, wherein each of said holding members (14, 15) comprises an axially inner portion (14) and an axially outer portion (15) movable selectively and independently of each other, under the action of the radial-movement devices (6).

12. Apparatus as claimed in claim 1, wherein said radial-movement devices (6) comprise, for each of the halves (3a, 3b) of the assembling drum (2):

- a supporting hub (18) coaxial with the geometric axis (X) of the drum (2), slidably engaging the holding members (14, 15) of the respective sectors (5) in a radial direction to said geometric axis (X);
- at least one radial-movement actuator (19, 20) operatively in engagement with said supporting hub (18) and axially movable relative thereto;

transmission connecting rods (21, 22) each operatively engaged between the radial-movement actuator (19, 20) and the holding member (14, 15) of one of said radial sectors (5) to give rise to a radial movement of the holding member (14, 15) following an axial movement transmitted by said radial-movement actuator (19, 20).

13. Apparatus as claimed in claim 11, wherein said radial-movement devices (6) comprise, for each of the halves (3a, 3b) of the assembling drum (2):
- a supporting hub (18) coaxial with the geometric axis (X) of the drum (2);
 - first guide elements (16) for slidably engaging the axially inner portions (14) of the holding members (14, 15) with the supporting hub (18), in a radial direction to said geometrical axis (X);
 - at least one first radial-movement actuator (19) operatively in engagement with said supporting hub (18) and axially movable relative thereto;
 - first transmission connecting rods (21), each operatively engaged between the first radial-movement actuator (19) and one of said axially inner portions (14) to give rise to a radial movement of said one radially inner portion following an axial movement transmitted by said first radial-movement actuator (19);
 - second guide elements (17) for slidable engagement of the axially outer portions (15) of the holding members (14, 15) with the supporting hub (18), in a radial direction to said geometric axis (X);
 - at least one second radial-movement actuator (20) operatively in engagement with said supporting hub (18) and axially movable relative thereto;
 - second transmission connecting rods (22) each operatively

engaged between the second radial-movement actuator (20) and one of said axially outer portions (15) to give rise to a radial movement of said one axially outer portion following an axial movement transmitted by said second radial-movement actuator (20).

14. Apparatus as claimed in claim 13, wherein in the radial sectors (5) of each of said first (3a) and second (3b) halves, are present axially inner powered portions (14a) operated by said radial-movement devices and driven axially inner portions (14b) dragged along in the radial movement of the powered axially inner portions (14a).

15. Tyre assembling apparatus according to claim 1, wherein at least one turning-up device (31) is associated with each of said first (3a) and second (3b) halves, to turn up a side edge (7a, 7b) of the carcass sleeve (8) around the respective annular anchoring structure (10).

16. Apparatus as claimed in claim 15, wherein each turning-up device (31) comprises:

- a plurality of turning-up levers (32) circumferentially distributed around the geometric axis (X) of the drum (2), each carrying a pressure element (33) facing the drum (2);

- at least one driving member (34) rotatably engaging each of said turning-up levers (32) at a hinging point (35) spaced apart from said pressure element (33);

- operation devices to axially translate the driving member (34) between a rest position in which it is axially spaced apart from the radial sectors (5) and a working position in which it is disposed close to said radial sectors.

17. Apparatus as claimed in claim 16, wherein the hinging point (35) of each of said turning-up levers (32) on the driving member (34) has, relative to the geometric axis (X) of the drum (2), a radial distance smaller than the radial distance measurable on the corresponding pressure element (33) when the driving member (34) is in its rest position.

18. Apparatus as claimed in claim 16, wherein the holding member (14, 15) of each radial sector (5) has, at an axially outer position, a lead-in surface (37) converging towards the geometric axis (X) of the drum (2) and facing the pressure element (33) carried by at least one of said turning-up levers (32).

19. Apparatus as claimed in claim 16, wherein each turning-up device (31) comprises at least one elastic element (36) extending around the geometric axis (X) of the drum (2) and operating on said turning-up levers (32) to transmit to the latter a radial-thrust action towards the geometric axis (X) of the drum itself.